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 NEWS  1          Web Page URLs for STN Seminar Schedule - N. America
 NEWS  2  Apr 08  "Ask CAS" for self-help around the clock
 NEWS  3  Apr 09  BEILSTEIN: Reload and Implementation of a New Subject Area
 NEWS  4  Apr 09  ZDB will be removed from STN
 NEWS  5  Apr 19  US Patent Applications available in IFICDB, IFIPAT, and IFIUDB
 NEWS  6  Apr 22  Records from IP.com available in CAPLUS, HCAPLUS, and ZCAPLUS
 NEWS  7  Apr 22  BIOSIS Gene Names now available in TOXCENTER
 NEWS  8  Apr 22  Federal Research in Progress (FEDRIP) now available
 NEWS  9  Jun 03  New e-mail delivery for search results now available
 NEWS 10  Jun 10  MEDLINE Reload
 NEWS 11  Jun 10  PCTFULL has been reloaded
 NEWS 12  Jul 02  FOREGE no longer contains STANDARDS file segment
 NEWS 13  Jul 22  USAN to be reloaded July 28, 2002;
                  saved answer sets no longer valid
 NEWS 14  Jul 29  Enhanced polymer searching in REGISTRY
 NEWS 15  Jul 30  NETFIRST to be removed from STN
 NEWS 16  Aug 08  CANCERLIT reload
 NEWS 17  Aug 08  PHARMAMarketLetter(PHARMAML) - new on STN
 NEWS 18  Aug 08  NTIS has been reloaded and enhanced
 NEWS 19  Aug 19  Aquatic Toxicity Information Retrieval (AQUIRE)
                  now available on STN
 NEWS 20  Aug 19  IFIPAT, IFICDB, and IFIUDB have been reloaded
 NEWS 21  Aug 19  The MEDLINE file segment of TOXCENTER has been reloaded
 NEWS 22  Aug 26  Sequence searching in REGISTRY enhanced
 NEWS 23  Sep 03  JAPIO has been reloaded and enhanced
 NEWS 24  Sep 16  Experimental properties added to the REGISTRY file
 NEWS 25  Sep 16  Indexing added to some pre-1967 records in CA/CAPLUS
 NEWS 26  Sep 16  CA Section Thesaurus available in CAPLUS and CA
 NEWS 27  Oct 01  CASREACT Enriched with Reactions from 1907 to 1985
 NEWS 28  Oct 21  EVENTLINE has been reloaded
 NEWS 29  Oct 24  BEILSTEIN adds new search fields
 NEWS 30  Oct 24  Nutraceuticals International (NUTRACEUT) now available on STN
 NEWS 31  Oct 25  MEDLINE SDI run of October 8, 2002                    on STN

 NEWS EXPRESS  October 14 CURRENT WINDOWS VERSION IS V6.01,
               CURRENT MACINTOSH VERSION IS V6.0a(ENG) AND V6.0Ja(JP),
               AND CURRENT DISCOVER FILE IS DATED 01 OCTOBER 2002
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FILE 'HOME' ENTERED AT 14:03:37 ON 29 OCT 2002

=> file agricola caplus biosis
COST IN U.S. DOLLARS SINCE FILE ENTRY TOTAL SESSION
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FILE 'AGRICOLA' ENTERED AT 14:03:56 ON 29 OCT 2002

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=> s l3
L3 NOT FOUND
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=> s ribosome and l3
L3 NOT FOUND
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=> s l3?
L1 1 L3?

=> d ti

L1 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Morphologic alteration in pyramidal cell dendrites following amphetamine sensitization in the rhesus monkey.

=> s ribosome? and l3?
L2 0 RIBOSOME? AND L3?

=> s ribosome? and PAP
L3 286 RIBOSOME? AND PAP

=> search l3 and ribosomal protein
L4 6 L3 AND RIBOSOMAL PROTEIN

=> dup rem l4
PROCESSING COMPLETED FOR L4
L5 4 DUP REM L4 (2 DUPLICATES REMOVED)

=> d 1-4 ti

L5 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
TI Active Center Cleft Residues of Pokeweed Antiviral Protein Mediate Its High-Affinity Binding to the **Ribosomal Protein** L3

L5 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2002 ACS
TI Virus/fungus-resistant transgenic plants expressing L3 proteins, and methods of reducing the toxicity of single-chain **ribosome** inhibitory proteins (RIPs)

L5 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
TI Pokeweed antiviral protein accesses **ribosomes** by binding to L3

L5 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2002 ACS
TI Reconstitution of the degradation of the mRNA for **ribosomal protein** S20 with purified enzymes

=> d 1-4 ab

L5 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
AB Pokeweed antiviral protein (**PAP**) is a **ribosome** -inactivating protein (RIP) which catalytically cleaves a specific adenine base from the highly conserved .alpha.-sarcin/ricin loop (SRL) of the large rRNA and thereby inhibits the protein synthesis. The **ribosomal protein** L3, a highly conserved protein located at the peptidyltransferase center of the **ribosomes**, is involved in binding of **PAP** to **ribosomes** and subsequent depurination of the SRL. We have recently discovered that recombinant **PAP** mutants with alanine substitution of the active center cleft residues 69NN70 (FLP-4) and 90FND92 (FLP-7) that are not directly involved in the catalytic depurination at the active site exhibit >150-fold reduced **ribosome** inhibitory activity [(2000) J. Biol. Chem. 275, 3382-3390]. We hypothesized that the partially exposed half of the active site cleft could be the potential docking site for the L3 mol. Our modeling studies presented herein indicated that **PAP** residues 90-96, 69-70, and 118-120 potentially interact with L3. Therefore, mutations of these residues were predicted to result in destabilization of interactions with rRNA and lead to a lower binding affinity with L3. In the present structure-function relationship study, coimmunopptn. assays with an in vitro synthesized yeast **ribosomal protein** L3 suggested that these mutant **PAP** proteins poorly interact with L3. The binding affinities of the mutant **PAP** proteins for **ribosomes** and recombinant L3 protein were calcd. from rate consts. and anal. of binding using surface plasmon resonance biosensor technol. Here, we show that, compared to wild-type **PAP**, FLP-4/69AA70 and FLP-7/90AAA92 exhibit significantly impaired affinity for **ribosomes** and L3 protein, which may account for their inability to efficiently inactivate **ribosomes**. By comparison, recombinant **PAP** mutants with alanine substitutions of residues 28KD29 and 111SR112 that are distant from the active center cleft showed normal binding affinity to **ribosomes** and L3 protein. The single amino acid mutants of **PAP** with alanine substitution of the active center cleft residues N69 (FLP-20), F90 (FLP-21), N91 (FLP-22), or D92 (FLP-23) also showed reduced **ribosome** binding as well as reduced L3 binding, further confirming the importance of the active center cleft for the **PAP-ribosome** and **PAP**-L3 interactions. The exptl. findings presented in this report provide unprecedented evidence that the active center cleft of **PAP** is important for its in vitro binding to **ribosomes** via the L3 protein.

L5 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2002 ACS
AB Disclosed are transgenic plants contg. an exogenous nucleic acid encoding L3, which is a highly conserved **ribosomal protein** that participates in the elongation of the **ribosome** along the mRNA. The plant exhibits increased resistance to viruses and/or fungi that infect plants. The L3 proteins include wild-type proteins, spontaneously

occurring mutants and non-naturally occurring L3 mutants. Also disclosed are methods of reducing the toxicity of single-chain **ribosome** inhibitory proteins (RIPs), such as pokeweed antiviral protein (**PAP**), in cells by co-administering the L3 protein with the RIP. Further disclosed are non-naturally occurring L3 mutants that (a) substantially fail to bind single-chain RIPs that bind endogeneous L3 proteins, (b) are unable to maintain M1 killer virus, (c) promote altered programmed ribosomal frameshift efficiency, (d) exhibit resistance to peptidyltransferase inhibitors, and combinations of any of (a)-(d).

L5 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2

AB Pokeweed antiviral protein (**PAP**), a 29-kDa **ribosome** -inactivating protein, catalytically removes an adenine residue from the conserved .alpha.-sarcin loop of the large rRNA, thereby preventing the binding of eEF-2.cntdot.GTP complex during protein elongation. Because the .alpha.-sarcin loop has been placed near the peptidyltransferase center in Escherichia coli **ribosomes**, we investigated the effects of alterations at the peptidyltransferase center on the activity of **PAP**. We demonstrate here that a chromosomal mutant of yeast, harboring the mak8-1 allele of peptidyltransferase-linked **ribosomal protein** L3 (RPL3), is resistant to the cytostatic effects of **PAP**. Unlike wild-type yeast, **ribosomes** from mak8-1 cells are not depurinated when **PAP** expression is induced in vivo, indicating that wild-type L3 is required for **ribosome** depurination. Co-immunopptn. studies show that **PAP** binds directly to L3 or Mak8-1p in vitro but does not phys. interact with **ribosome**-assocd. Mak8-1p. L3 is required for **PAP** to bind to **ribosomes** and depurinate the 25 S rRNA, suggesting that it is located in close proximity to the .alpha.-sarcin loop. These results demonstrate for the first time that a **ribosomal protein** provides a receptor site for an **ribosome**-inactivating protein and allows depurination of the target adenine.

L5 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2002 ACS

AB Previous work has implicated poly(A) polymerase I (**PAP** I), encoded by the pcnB gene, in the decay of a no. of RNAs from Escherichia coli. We show here that **PAP** I does not promote the initiation of decay of the rpsT mRNA encoding **ribosomal protein** S20 in vivo; however, it does facilitate the degrdn. of highly folded degradative intermediates by polynucleotide phosphorylase. As expected, purified degradosomes, a multi-protein complex contg., among others, RNase E, PNPase, and RhlB, generate an authentic 147-residue RNase E cleavage product from the rpsT mRNA in vitro. However, degradosomes are unable to degrade the 147-residue fragment in the presence of ATP even when it is oligoadenylated. Rather, both continuous cycles of polyadenylation and PNPase activity are necessary and sufficient for the complete decay of the 147-residue fragment in a process which can be antagonized by the action of RNase II. Moreover, both ATP and a non-hydrolyzable analog, ATP.gamma.S, support the **PAP** I and PNPase-dependent degrdn. of the 147-residue intermediate implying that ATPase activity, such as that which may reside in RhlB, a putative RNA helicase, is not necessarily required. Alternatively, the rpsT mRNA can be degraded in vitro by a second 3'-decay pathway which is dependent on **PAP** I, PNPase and ATP alone. Our results demonstrate that a hierarchy of RNA secondary structures controls access to exonucleolytic attack on 3' termini. Moreover, decay of a model mRNA can be reconstituted in vitro by a small no. of purified components in a process which is more dynamic and ATP-dependent than previously imagined. (c) 1998 Academic Press.

=> d so

L5 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1

SO Biochemistry (2001), 40(31), 9104-9114
CODEN: BICHAW; ISSN: 0006-2960

=> d 2 pi

L5 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2002 ACS

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000039291	A1	20000706	WO 1999-US31312	19991230

PI
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

=> d 3 so

L5 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
SO Journal of Biological Chemistry (1999), 274(6), 3859-3864
CODEN: JBCHA3; ISSN: 0021-9258

=> s ribosomal protein l3
MISSING OPERATOR PROTEIN L3
The search profile that was entered contains terms or
nested terms that are not separated by a logical operator.

=> s (rip or ribosome inactivating protein) and ribosome?
L6 1900 (RIP OR RIBOSOME INACTIVATING PROTEIN) AND RIBOSOME?

=> s l6 and virus
L7 199 L6 AND VIRUS

=> s l7 and transgenic
L8 35 L7 AND TRANSGENIC

=> dup rem l8
PROCESSING COMPLETED FOR L8
L9 23 DUP REM L8 (12 DUPLICATES REMOVED)

=> d 1-23 ti

L9 ANSWER 1 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Promoters of S-adenosyl-L-methionine: jasmonic acid carboxyl methyltransferase genes and method for producing target protein in **transgenic** plants using the same

L9 ANSWER 2 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
TI A complex fruit-specific type-2 **ribosome-inactivating protein** from elderberry (Sambucus nigra) is correctly processed and assembled in **transgenic** tobacco plants

L9 ANSWER 3 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
TI Expression of recombinant trichosanthin, a **ribosome-inactivating protein**, in **transgenic** tobacco

L9 ANSWER 4 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 3
TI The Sambucus nigra type-2 **ribosome-inactivating**

protein SNA-I' exhibits in planta antiviral activity in **transgenic** tobacco

L9 ANSWER 5 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Antigen-binding fragments specific for dendritic cells, compositions and methods of use thereof antigens recognized thereby and cells obtained thereby

L9 ANSWER 6 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI **Virus**/fungus-resistant **transgenic** plants expressing L3 proteins, and methods of reducing the toxicity of single-chain **ribosome** inhibitory proteins (RIPs)

L9 ANSWER 7 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Fusion proteins containing plant pathogen-binding- and toxin domains and **transgenic** plants with enhanced disease resistance

L9 ANSWER 8 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 4
TI Expression of active barley seed **ribosome-inactivating protein** in **transgenic** wheat

L9 ANSWER 9 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI A non-toxic pokeweed antiviral protein mutant inhibits pathogen infection via a novel salicylic acid-independent pathway

L9 ANSWER 10 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI **Transgenic** plants producing a nontoxic mutants PAP-II protein with anti-viral and/or anti-fungal activity

L9 ANSWER 11 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Transformation of poinsettia and the development of insect-resistant varieties

L9 ANSWER 12 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 5
TI Transformation and expression of trichosanthin gene in tomato

L9 ANSWER 13 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 6
TI Antiviral activity of a type 1 **ribosome-inactivating protein** from Chenopodium album L.

L9 ANSWER 14 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Expression of trichosanthin in **transgenic** tobacco plants and suspension cultures

L9 ANSWER 15 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Expression of trichosanthin in **transgenic** tobacco plants and suspension cultures

L9 ANSWER 16 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Expression of **ribosome inactivating protein** gene under control of a **virus** subgenomic promoter

L9 ANSWER 17 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Neuroendocrine cell lines for efficient synthesis and secretion of foreign proteins

L9 ANSWER 18 OF 23 AGRICOLA DUPLICATE 7
TI Expression of the **ribosome-inactivating protein** JIP60 from barley in **transgenic** tobacco leads to an abnormal phenotype and alterations on the level of translation.

L9 ANSWER 19 OF 23 AGRICOLA DUPLICATE 8
TI Transactivation of dianthin transgene expression by African cassava mosaic **virus** AC2.

L9 ANSWER 20 OF 23 AGRICOLA DUPLICATE 9
TI Resistance to geminivirus infection by **virus**-induced expression of dianthin in **transgenic** plants.

L9 ANSWER 21 OF 23 AGRICOLA
TI Expression of active, processed ricin in **transgenic** tobacco.

L9 ANSWER 22 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 10
TI Expression of active, processed ricin in **transgenic** tobacco

L9 ANSWER 23 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI Rapid, high-level expression of biologically active .alpha.-trichosanthin in transfected plants by an RNA viral vector

=> d 3 so

L9 ANSWER 3 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
SO Journal of Biotechnology (2002), 97(1), 69-88
CODEN: JBITD4; ISSN: 0168-1656

=> d 3 ab

L9 ANSWER 3 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
AB Trichosanthin (TCS) is an antiviral plant defense protein, classified as a type-I **ribosome-inactivating protein**, found in the root tuber and leaves of the medicinal plant Trichosanthes kirilowii. It is processed from a larger precursor protein, contg. a 23 amino acid amino (N)-terminal sequence (pre sequence) and a 19 amino acid carboxy (C)-terminal extension (pro sequence). Various constructs of the TCS gene were expressed in **transgenic** tobacco plants to det. the effects of the amino- and carboxy-coding gene sequences on TCS expression and host toxicity in plants. The max. TCS expression levels of 2.7% of total sol. protein (0.05% of total dry wt.) were obtained in **transgenic** tobacco plants carrying the complete prepro-TCS gene sequence under the Cauliflower mosaic **virus** 35S RNA promoter. The N-terminal sequence matched the native TCS sequence indicating that the T. kirilowii signal sequence was properly processed in tobacco and the protein translation inhibitory activity of purified rTCS was similar to native TCS. One hundred-fold lower expression levels and phenotypic aberrations were evident in plants expressing the gene constructs without the C-terminal coding sequence. **Transgenic** tobacco plants expressing recombinant TCS exhibited delayed symptoms of systemic infection following exposure to Cucumber mosaic **virus** and Tobacco mosaic **virus** (TMV). Local lesion assays using exts. from the infected **transgenic** plants indicated reduced levels of TMV compared with nontransgenic controls.

=> d 3 so

L9 ANSWER 3 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
SO Journal of Biotechnology (2002), 97(1), 69-88
CODEN: JBITD4; ISSN: 0168-1656

=> d 8 ab

L9 ANSWER 8 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 4
AB Phenotypically normal, **transgenic** wheat (Triticum aestivum, var. Frisal) plants expressing a barley seed **ribosome-inactivating protein** (**RIP**) were produced.

Expression was controlled by an intron-enhanced cauliflower mosaic **virus** 35S promoter and has been completely stable over four generations so far, possibly due to matrix-assocd. regions (MARs) that flank the transgenes. An engineered fusion to a signal peptide derived from the barley seed ss-1,3-glucanase caused the transport of **RIP** to the apoplast. Activity of the accumulated protein could be shown by significant inhibition of a rabbit reticulocyte transcription/translation system. Plants expressing high levels of **RIP** were protected only moderately or not at all against infection by the fungal pathogen Erysiphe graminis.

=> d 8 so

L9 ANSWER 8 OF 23 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 4
SO Theoretical and Applied Genetics (2000), 100(5), 755-763
CODEN: THAGA6; ISSN: 0040-5752

=> d 7 ab

L9 ANSWER 7 OF 23 CAPLUS COPYRIGHT 2002 ACS
AB The invention provides fusion proteins comprising a pathogen-binding domain (e.g., an antibody, or part(s) thereof) and a protein which is toxic to the pathogen (e.g., an enzyme such as RNase of superoxide dismutase). Also provided are chimeric genes encoding said fusion proteins and their expression in host cells. Expression of the chimeric genes in plants provides **transgenic** plants with enhanced pathogen resistance. These fusion proteins may be expressed and targeted to cellular membranes or plant cell compartments in different orientations and also can be cleaved in vivo by different proteases to become active. These agents are named "mol. pathogenicides". Thus, expression, in tobacco, of a chimeric gene for a anti-tobacco mosaic **virus** coat protein scFv fused to the transmembrane domain of the human T cell receptor .beta. chain, resulted in enhanced resistance to TMV.

=> d 10 ab

L9 ANSWER 10 OF 23 CAPLUS COPYRIGHT 2002 ACS
AB Disclosed are recombinant plant cells, plant cell parts, plant parts and **transgenic** plants contg. a DNA mol. comprising a sequence encoding a Pokeweed Antiviral Protein (PAP) II protein. PAP II proteins include full length, wild-type PAP II and substantially nontoxic mutants or analogs including fragments thereof truncated at the C-terminus and other PAP II proteins having an intact catalytic active site amino acid residue E172 but that also have at least one amino acid substitution or deletion, and possess anti-viral and/or anti-fungal activity. DNA mols. comprising sequences encoding the mutants or analogs, as well as the isolated and purified PAP II proteins per se , are also disclosed. Methods of identifying nontoxic PAP II mutants are further disclosed. **Transgenic** plants that produce a PAP II protein exhibit anti-viral and/or anti-fungal activity. Virtually all flowering plants are included. Seed derived from the **transgenic** plants are also provided.

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or the STNGUIDE file for information on formats available in
individual files.
REENTER DISPLAY FORMAT FOR ALL FILES (FILEDEFAULT):clms
'CLMS' IS NOT A VALID FORMAT

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L9 ANSWER 10 OF 23 CAPLUS COPYRIGHT 2002 ACS
TI **Transgenic** plants producing a nontoxic mutants PAP-II protein
with anti-viral and/or anti-fungal activity

=> d 10 pi

L9 ANSWER 10 OF 23 CAPLUS COPYRIGHT 2002 ACS

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9960843	A1	19991202	WO 1999-US11301	19990521
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2329150	AA	19991202	CA 1999-2329150	19990521
AU 9940087	A1	19991213	AU 1999-40087	19990521

=> d 16 ab

L9 ANSWER 16 OF 23 CAPLUS COPYRIGHT 2002 ACS
AB The design of **virus**-resistant **transgenic** plants based
on expression of chimeric transcript contg. **ribosome**
inactivating protein (**RIP**) gene under control
of a **virus** subgenomic promoter was described. The **virus**
infection of these plants coused formation of antisense **RIP** mRNA
and protein synthesis suppression only in infected cell, therefore
blocking **virus** infection. The intermediate (ppA18) plasmid
vector were constructed using the potato **virus** X capsid protein
gene promoter and the diphtheria toxin A gene. The cauliflower mosaic
virus 35S promoter and polyA signal were included into final
genetic construction (BpA191) which were introduced into Agrobacterium
tumefaciens following by plants transformation.

=> d 16 so

L9 ANSWER 16 OF 23 CAPLUS COPYRIGHT 2002 ACS
SO Doklady Akademii Nauk (1998), 360(4), 559-562
CODEN: DAKNEQ; ISSN: 0869-5652

=> d 18 ab

L9 ANSWER 18 OF 23 AGRICOLA DUPLICATE 7
AB In this paper we report the in-planta activity of the **ribosome-**
inactivating protein JIP60, a 60-kDa jasmonate-induced
protein from barley (Hordeum vulgare L.), in **transgenic** tobacco
(Nicotiana tabacum L.) plants. All plants expressing the complete JIP60
cDNA under the control of the cauliflower mosaic **virus** (CaMV)
35S promoter exhibited conspicuous and similar phenotypic alterations,
such as slower growth, shorter internodes, lanceolate leaves, reduced root

development, and premature senescence of leaves. Microscopic inspection of developing leaves showed a loss of residual meristems and higher degree of vacuolation of mesophyll cells as compared to the wild type. When probed with an antiserum which was immunoreactive against both the N- and the C-terminal half of JIP60, a polypeptide with a molecular mass of about 30 kDa, most probably a processed JIP60 product, could be detected. Phenotypic alterations could be correlated with the differences in the detectable amount of the JIP60 mRNA and processed JIP60 protein. The protein biosynthesis of the transformants was characterized by an increased polysome/monosome ratio but a decreased in-vivo translation activity. These findings suggest that JIP60 perturbs the translation machinery in planta. An immunohistological analysis using the JIP60 antiserum indicated that the immunoreactive polypeptide(s) are located mainly in the nucleus of **transgenic** tobacco leaf cells and to a minor extent in the cytoplasm.

=> d 18 so

L9 ANSWER 18 OF 23 AGRICOLA DUPLICATE 7
SO Planta, 1997. Vol. 202, No. 4. p. 470-478
Publisher: Berlin ; New York : Springer-Verlag, 1925-
CODEN: PLANAB; ISSN: 0032-0935

=> d 19 ab

L9 ANSWER 19 OF 23 AGRICOLA DUPLICATE 8
AB We have recently described a novel strategy for engineering resistance to African cassava mosaic **virus** (ACMV) in **transgenic** Nicotiana benthamiana plants using a **virus**-inducible promoter to control the expression of a plant **ribosome-inactivating protein** (**RIP**) transgene (Y. Hong et al., Virology 220, 119-127, 1996). Here, we have used a potato **virus** X (PVX) vector to express the ACMV transactivator protein, AC2, in planta. We confirm that amplification of **RIP** activity in **transgenic** plants is mediated by AC2; disruption of AC2 expression by either the introduction of an in-frame stop codon or the deletion of 5'-terminal or 3'-terminal coding sequences reduced **RIP** expression to the basal level associated with PVX-infected plants. AC2 expression from the PVX vector induced necrosis in nontransformed plants as well as in plants containing the **RIP** transgene, suggesting that the protein can functionally interact with PVX and/or host factors. The potential of this system to provide a direct and sensitive assay to investigate AC2 function in planta is discussed.

=> d 20 ab

L9 ANSWER 20 OF 23 AGRICOLA DUPLICATE 9
AB **Ribosome**-inactivating proteins (RIPs) are naturally occurring plant toxins that exhibit antiviral activity against a diverse range of plant and animal viruses. Here, the action of dianthin, a potent **RIP** isolated from Dianthus caryophyllus, has been exploited to engineer resistance to a plant DNA **virus**, African cassava mosaic **virus** (ACMV), in **transgenic** Nicotiana benthamiana. To achieve this, dianthin has been expressed from the ACMV virion-sense promoter that is transactivated by the product of viral gene AC2. This avoids the need for constitutive expression of the **RIP**, facilitating the regeneration of phenotypically normal plants, and ensures transgene expression is localized to **virus**-infected cells. When challenged with ACMV, **transgenic** plants produce atypical necrotic lesions on inoculated leaves, indicative of dianthin expression, viral DNA accumulation is significantly reduced in these tissues, and

plants exhibit attenuated systemic symptoms from which they recover. This phenotype holds for isolates of ACMV but not for other geminiviruses, suggesting that AC2 homologues from the latter are unable to efficiently transactivate the ACMV promoter.

=> d 21 ab

L9 ANSWER 21 OF 23 AGRICOLA
AB The cDNA encoding the plant toxin precursor preproricin was introduced into tobacco via Agrobacterium tumefaciens-mediated gene transfer. **Transgenic** plants were assayed for type II **ribosome-inactivating protein** expression and activity. Western blot analysis of soluble leaf extracts using anti-ricin a-chain (RTA) antibodies identified 34- and 32-kDa proteins, which were electrophoretically indistinguishable from castor seed RTA. Analysis with anti-ricin b-chain (RTB) antibodies identified both a 34-kDa protein major band, which co-migrated with castor seed RTB, and a 30-kDa protein minor band. Enzyme-linked immunoassay of the **transgenic** leaf extracts with anti-RTA and anti-RTB indicated microgram per gram production on a fresh weight basis of soluble extractable recombinant ricin. Sugar binding enzyme-linked immunoassay employing an immobilized glycoprotein, asialofetuin, and anti-RTB antibodies confirmed the characteristic type II **ribosome-inactivating protein** galactose binding lectin activity of the recombinant ricin. The enzymatic activity of recombinant ricin was characterized for cell-free translation inhibition, as well as for overall cytotoxicity. A 50% inhibitory dose of 3 X 10(-11) M was observed for the immunoreactive leaf extract material using a rabbit reticulocyte translation inhibition assay, while a 50% lethal dose of 1 X 10(-12) M was calculated with human T-lymphotropic **virus**-1 infected leukemic T-cells.

=> s frameshift? and virus and plant?
L10 273 FRAMESHIFT? AND VIRUS AND PLANT?

=> s l10 and ribosome?
L11 31 L10 AND RIBOSOME?

=> dup rem l11
PROCESSING COMPLETED FOR L11
L12 28 DUP REM L11 (3 DUPLICATES REMOVED)

=> d 1-10 ti

L12 ANSWER 1 OF 28 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
TI A - 1 ribosomal **frameshift** element that requires base pairing across four kilobases suggests a mechanism of regulating **ribosome** and replicase traffic on a viral RNA

L12 ANSWER 2 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Metal ions and flexibility in a viral RNA pseudoknot at atomic resolution.

L12 ANSWER 3 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI New targets for antivirals: The ribosomal A-site and the factors that interact with it.

L12 ANSWER 4 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Ribosomal protein L5 helps anchor peptidyl-tRNA to the P-site in Saccharomyces cerevisiae.

L12 ANSWER 5 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Architecture of H-type pseudoknots and the role of pseudknots in **frameshifting**.

L12 ANSWER 6 OF 28 CAPLUS COPYRIGHT 2002 ACS
TI **Virus**/fungus-resistant transgenic **plants** expressing L3 proteins, and methods of reducing the toxicity of single-chain **ribosome** inhibitory proteins (RIPs)

L12 ANSWER 7 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Kinetics of ribosomal pausing during programmed -1 translational **frameshifting**.

L12 ANSWER 8 OF 28 CAPLUS COPYRIGHT 2002 ACS
TI Recoding

L12 ANSWER 9 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI Ribosomal protein L3 mutants alter translational fidelity and promote rapid loss of the yeast killer **virus**.

L12 ANSWER 10 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI The mof2/Sui1 protein is a general monitor of translational accuracy.

=> d 9 so

L12 ANSWER 9 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
SO Molecular and Cellular Biology, (Jan., 1999) Vol. 19, No. 1, pp. 384-391. ISSN: 0270-7306.

=> d 9 ab

L12 ANSWER 9 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
AB Programmed -1 ribosomal **frameshifting** is utilized by a number of RNA viruses as a means of ensuring the correct ratio of viral structural to enzymatic proteins available for viral particle assembly. Altering **frameshifting** efficiencies upsets this ratio, interfering with **virus** propagation. We have previously demonstrated that compounds that alter the kinetics of the peptidyl-transfer reaction affect programmed -1 ribosomal **frameshift** efficiencies and interfere with viral propagation in yeast. Here, the use of a genetic approach lends further support to the hypothesis that alterations affecting the **ribosome**'s peptidyltransferase activity lead to changes in **frameshifting** efficiency and **virus** loss. Mutations in the RPL3 gene, which encodes a ribosomal protein located at the peptidyltransferase center, promote approximately three- to fourfold increases in programmed - 1 ribosomal **frameshift** efficiencies and loss of the M1 killer **virus** of yeast. The mak8-1 allele of RPL3 contains two adjacent missense mutations which are predicted to structurally alter the Mak8-1p. Furthermore, a second allele that encodes the N-terminal 100 amino acids of L3 (called L3A) exerts a trans-dominant effect on programmed -1 ribosomal **frameshifting** and killer **virus** maintenance. Taken together, these results support the hypothesis that alterations in the peptidyltransferase center affect programmed -1 ribosomal **frameshifting**.

=> d ab

L12 ANSWER 1 OF 28 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
AB Programmed - 1 ribosomal **frameshifting** is necessary for translation of the polymerase genes of many viruses. In addn. to the consensus elements in the mRNA around the **frameshift** site, we found previously that **frameshifting** on Barley yellow dwarf **virus** RNA requires viral sequence located four kilobases downstream. By using dual luciferase reporter constructs, we now show

that a predicted loop in the far downstream **frameshift** element must base pair to a bulge in a bulged stem loop adjacent to the **frameshift** site. Introduction of either two or six base mismatches in either the bulge or the far downstream loop abolished **frameshifting**, whereas mutations in both sites that restored base pairing reestablished **frameshifting**. Likewise, disruption of this base pairing abolished viral RNA replication in **plant** cells, and restoration of base pairing completely reestablished **virus** replication. We propose a model in which Barley yellow dwarf **virus** uses this and another long-distance base-pairing event required for cap-independent translation to allow the replicase copying from the 3' end to shut off translation of upstream ORFs and free the RNA of **ribosomes** to allow unimpeded replication. This would be a means of solving the "problem," common to pos. strand RNA viruses, of competition between **ribosomes** and replicase for the same RNA template.

=> d 3 a
'A' IS NOT A VALID FORMAT
In a multifile environment, a format can only be used if it is valid in at least one of the files. Refer to file specific help messages or the STNGUIDE file for information on formats available in individual files.
REENTER DISPLAY FORMAT FOR ALL FILES (FILEDEFAULT):ab

L12 ANSWER 3 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
AB Many viruses use programmed -1 ribosomal **frameshifting** to ensure the correct ratio of viral structural to enzymatic proteins. Alteration of **frameshift** efficiencies changes these ratios, in turn inhibiting viral particle assembly and **virus** propagation. Previous studies determined that anisomycin, a peptidyl transferase inhibitor, specifically inhibited -1 **frameshifting** and the ability of yeast cells to propagate the L-A and M1 dsRNA viruses (J. D. Dinman, M. J. Ruiz-Echevarria, K. Czaplinski, and S. W. Peltz, 1997, Proc. Natl. Acad. Sci. USA 94, 6606-6611). Here we show that preussin, a pyrollidine that is structurally similar to anisomycin (R. E. Schwartz, J. Liesch, O. Hensens, L. Zitano, S. Honeycutt, G. Garrity, R. A. Fromtling, J. Onishi, and R. Monaghan, 1988. J. Antibiot. (Tokyo) 41, 1774-1779), also inhibits -1 programmed ribosomal **frameshifting** and **virus** propagation by acting at the same site or through the same mechanism as anisomycin. Since anisomycin is known to assert its effect at the ribosomal A-site, we undertook a pharmacogenetic analysis of mutants of trans-acting eukaryotic elongation factors (eEFs) that function at this region of the **ribosome**. Among mutants of eEF1A, a correlation is observed between resistance/susceptibility profiles to preussin and anisomycin, and these in turn correlate with programmed -1 ribosomal **frameshifting** efficiencies and killer **virus** phenotypes. Among mutants of eEF2, the extent of resistance to preussin correlates with resistance to sordarin, an eEF2 inhibitor. These results suggest that structural features associated with the ribosomal A-site and with the trans-acting factors that interact with it may present a new set of molecular targets for the rational design of antiviral compounds.

=> d 7 ab

L12 ANSWER 7 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
AB In the Saccharomyces cerevisiae double-stranded RNA **virus**, programmed -1 ribosomal **frameshifting** is responsible for translation of the second open reading frame of the essential viral RNA. A typical slippery site and downstream pseudoknot are necessary for this **frameshifting** event, and previous work has demonstrated that **ribosomes** pause over the slippery site. The translational

intermediate associated with a **ribosome** paused at this position is detected, and, using in vitro translation and quantitative heelprinting, the rates of synthesis, the ribosomal pause time, the proportion of **ribosomes** paused at the slippery site, and the fraction of paused **ribosomes** that **frameshift** are estimated. About 10% of **ribosomes** pause at the slippery site in vitro, and some 60% of these continue in the -1 frame. **Ribosomes** that continue in the -1 frame pause about 10 times longer than it takes to complete a peptide bond in vitro. Altering the rate of translational initiation alters the rate of **frameshifting** in vivo. Our in vitro and in vivo experiments can best be interpreted to mean that there are three methods by which **ribosomes** pass the **frameshift** site, only one of which results in **frameshifting**.

```
=> s ((tumer n?) or (tumer, n?))/au
L13         368 ((TUMER N?) OR (TUMER, N?))/AU

=> s l13 and ribosome?
L14          36 L13 AND RIBOSOME?

=> del l14 y

=> s l13 and ribosom?
L14          42 L13 AND RIBOSOM?

=> dup rem l14
PROCESSING COMPLETED FOR L14
L15          21 DUP REM L14 (21 DUPLICATES REMOVED)

=> d 1-10 ti

L15  ANSWER 1 OF 21  CAPLUS  COPYRIGHT 2002 ACS
TI   Non-cytotoxic pokeweed antiviral protein (PAP) mutants

L15  ANSWER 2 OF 21  CAPLUS  COPYRIGHT 2002 ACS
TI   Pokeweed Antiviral Protein Regulates the Stability of Its Own mRNA by a
     Mechanism That Requires Depurination but Can Be Separated from
     Depurination of the .alpha.-Sarcin/Ricin Loop of rRNA

L15  ANSWER 3 OF 21  CAPLUS  COPYRIGHT 2002 ACS        DUPLICATE 1
TI   Pokeweed antiviral protein binds to the cap structure of eukaryotic mRNA
     and depurinates the mRNA downstream of the cap

L15  ANSWER 4 OF 21  AGRICOLA                          DUPLICATE 2
TI   A C-terminal deletion mutant of pokeweed antiviral protein inhibits
     programmed +1 ribosomal frameshifting and Ty1 retrotransposition
     without depurinating the sarcin/ricin loop of rRNA.

L15  ANSWER 5 OF 21  CAPLUS  COPYRIGHT 2002 ACS
TI   Virus/fungus-resistant transgenic plants expressing L3 proteins, and
     methods of reducing the toxicity of single-chain ribosome
     inhibitory proteins (RIPs)

L15  ANSWER 6 OF 21  BIOSIS  COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
TI   Virus resistance mediated by ribosome inactivating proteins.

L15  ANSWER 7 OF 21  CAPLUS  COPYRIGHT 2002 ACS        DUPLICATE 3
TI   A novel mechanism for inhibition of translation by pokeweed antiviral
     protein: depurination of the capped RNA template

L15  ANSWER 8 OF 21  CAPLUS  COPYRIGHT 2002 ACS
TI   Virus resistance mediated by ribosome activating proteins
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L15 ANSWER 9 OF 21 AGRICOLA DUPLICATE 4
TI A non-toxic pokeweed antiviral protein mutant inhibits pathogen infection via a novel salicylic acid-independent pathway.

L15 ANSWER 10 OF 21 CAPLUS COPYRIGHT 2002 ACS
TI Transgenic plants producing a nontoxic mutants PAP-II protein with anti-viral and/or anti-fungal activity

=> d 2 aB

L15 ANSWER 2 OF 21 CAPLUS COPYRIGHT 2002 ACS
AB Pokeweed antiviral protein (PAP), a single chain **ribosome**-inactivating protein (RIP) isolated from pokeweed plants (Phytolacca americana), removes specific adenine and guanine residues from the highly conserved, .alpha.-sarcin/ricin loop in the large rRNA, resulting in inhibition of protein synthesis. We recently demonstrated that PAP could also inhibit translation of mRNAs and viral RNAs that are capped by binding to the cap structure and depurinating the RNAs downstream of the cap. Cell growth is inhibited when PAP cDNA is expressed in the yeast Saccharomyces cerevisiae under the control of the galactose-inducible GAL1 promoter. Here, we show that overexpression of wild type PAP in yeast leads to a decrease in PAP mRNA abundance. The decrease in mRNA levels is not obsd. with an active site mutant, indicating that it is due to the N-glycosidase activity of the protein. PAP expression had no effect on steady state levels of mRNA from four different endogenous yeast genes examd., indicating specificity. We demonstrate that PAP can depurinate the rRNA in trans in a translation-independent manner. When rRNA is depurinated and translation is inhibited, the steady state levels of PAP mRNA increase dramatically relative to the U3 snoRNA. Using a PAP variant which depurinates rRNA, inhibits translation but does not destabilize its mRNA, we demonstrate that PAP mRNA is destabilized after its levels are up-regulated by a mechanism that occurs independently of rRNA depurination and translation. We quantify the extent of rRNA depurination in vivo using a novel primer extension assay and show that the temporal pattern of rRNA depurination is similar to the pattern of PAP mRNA destabilization, suggesting that they may occur by a common mechanism. These results provide the first in vivo evidence that a single chain RIP targets not only the large rRNA but also its own mRNA. These findings have implications for understanding the biol. function of RIPs.

=> d 2 so

L15 ANSWER 2 OF 21 CAPLUS COPYRIGHT 2002 ACS
SO Journal of Biological Chemistry (2002), 277(44), 41428-41437
CODEN: JBCHA3; ISSN: 0021-9258

=> d 3 ab

L15 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
AB Several cap-binding proteins from both the nucleus and cytosol have been identified that mediate processes such as pre-mRNA splicing, translation initiation, and mRNA turnover. Here we describe a novel cap-binding protein, pokeweed antiviral protein (PAP), a 29-kDa type I **ribosome**-inactivating protein (RIP) isolated from Phytolacca americana. In addn. to depurinating the sarcin/ricin loop of the large rRNA, an activity common to all RIPs, we have reported recently that PAP depurinates capped, but not uncapped RNAs in vitro. Here we characterize this activity further and, using affinity chromatog., show that PAP binds to the m7Gppp cap structure. PAP UV-crosslinks to m7GpppG-capped luciferase mRNA more efficiently than GpppG-capped luciferase mRNA, indicating specificity for the methylated guanosine. We present evidence

that PAP does not remove the cap structure or depurinate the m7Gppp as shown by primer extension of capped and uncapped luciferase transcripts incubated with PAP. Modeling studies of cap interaction with PAP predict that the cap structure would bind to the active site of PAP in a similar manner to guanine. We map the depurination sites on the capped luciferase RNA and illustrate that depurination occurs at specific adenine and guanine residues throughout the RNA sequence. Incubation of isolated **ribosomes** with PAP and increasing molar concns. of m7GpppG relative to PAP resulted in a decrease in the level of rRNA depurination. Therefore, at elevated concns., the methylated cap structure competes with the adenine or guanine for binding to PAP, even though the affinity of PAP for capped message is almost fourfold lower than for rRNA. These results demonstrate that the activity of PAP is not limited to rRNA depurination, but that PAP binds to the cap structure and depurinates mRNAs downstream of the cap in vitro. These findings may have implications for understanding PAP activity in vivo.

=> d 3 so

L15 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
SO RNA (2002), 8(9), 1148-1159
CODEN: RNARFU; ISSN: 1355-8382

=> d 6 ab

L15 ANSWER 6 OF 21 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

=> d 6 so

L15 ANSWER 6 OF 21 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
SO Maramorosch, Karl [Editor]; Murphy, Frederick A. [Editor]; Shatkin, Aaron J. [Editor]. Advances in Virus Research, (2000) Vol. 55, pp. 325-355. Advances in Virus Research. print.
Publisher: Academic Press Inc. 525 B Street, Suite 1900, San Diego, CA, 92101-4495, USA.
ISSN: 0065-3527. ISBN: 0-12-039855-9 (cloth).

=> d 10 ab

L15 ANSWER 10 OF 21 CAPLUS COPYRIGHT 2002 ACS
AB Disclosed are recombinant plant cells, plant cell parts, plant parts and transgenic plants contg. a DNA mol. comprising a sequence encoding a Pokeweed Antiviral Protein (PAP) II protein. PAP II proteins include full length, wild-type PAP II and substantially nontoxic mutants or analogs including fragments thereof truncated at the C-terminus and other PAP II proteins having an intact catalytic active site amino acid residue E172 but that also have at least one amino acid substitution or deletion, and possess anti-viral and/or anti-fungal activity. DNA mols. comprising sequences encoding the mutants or analogs, as well as the isolated and purified PAP II proteins per se , are also disclosed. Methods of identifying nontoxic PAP II mutants are further disclosed. Transgenic plants that produce a PAP II protein exhibit anti-viral and/or anti-fungal activity. Virtually all flowering plants are included. Seed derived from the transgenic plants are also provided.

=> d 16 ab

L15 ANSWER 16 OF 21 AGRICOLA DUPLICATE 10
AB Pokeweed antiviral protein (PAP), a 29-kD protein isolated from Phytolacca

americana, inhibits translation by catalytically removing a specific adenine residue from the large rRNA of the 60S subunit of eukaryotic **ribosomes**. Transgenic tobacco (Nicotiana tabacum) plants expressing PAP or a variant (PAP-v) were shown to be resistant to a broad spectrum of plant viruses. Expression of PAP-v in transgenic plants induces synthesis of pathogenesis-related proteins and a very weak (<2-fold) increase in salicylic acid levels. Using reciprocal grafting experiments, we demonstrate here that transgenic tobacco rootstocks expressing PAP-v induce resistance to tobacco mosaic virus infection in both N. tabacum NN and nn scions. Increased resistance to potato virus X was also-observed in N. tabacum nn scions grafted on transgenic rootstocks. PAP expression was not detected in the wild-type scions or rootstocks that showed virus resistance, nor was there any increase in salicylic acid levels or pathogenesis-related protein synthesis. Grafting experiments with transgenic plants expressing an inactive PAP mutant demonstrated that an intact active site of PAP is necessary for induction of virus resistance in wild-type scions. These results indicate that enzymatic activity of PAP is responsible for generating a signal that renders wild-type scions resistant to virus infection in the absence of increased salicylic acid levels and pathogenesis-related protein synthesis.